**Supplement Table 1.** Demographics and clinical characteristics of patients from Sun Yat-sen University Cancer Center

|  |  |  |
| --- | --- | --- |
| Variable | Training cohort (n = 273) | Internal validation cohort (n = 133) |
| Benignancy (n = 96)No. (%) or Mean ± sd | Malignancy (n = 177)No. (%) or Mean ± sd | Benignancy (n = 47)No. (%) or Mean ± sd | Malignancy (n = 86)No. (%) or Mean ± sd |
| Characteristics |  |  |  |  |
| Gender |  |  |  |  |
| Male | 75 (78.1%) | 114 (64.4%) | 33 (70.2%) | 56 (65.1%) |
| Female | 21 (21.9%) | 63 (35.6%) | 14 (29.8%) | 30 (34.9%) |
| Age (years) | 55.1 ± 10.8 | 59.8 ± 9.2 | 48.5 ± 11.6 | 60.1 ± 10.6 |
| Height  | 165.6 ± 6.7 | 164.4 ± 7.3 | 166.2 ± 9.3 | 163.6 ± 7.7 |
| Weight | 63.9 ± 11.2 | 61.7 ± 9.1 | 62.7 ± 9.7 | 62.9 ± 9.8 |
| BMI (kg/m2) | 23.2 ± 3.3 | 22.8 ± 3.0 | 22.7 ± 2.7 | 23.5 ± 2.9 |
| Smoke |  |  |  |  |
| Yes | 53 (55.2%) | 86 (48.6%) | 19 (40.4%) | 45 (52.3%) |
| No | 43 (44.8%) | 91 (51.4%) | 28 (59.6%) | 41 (47.7%) |
| Family history of cancer |  |  |  |  |
| Yes | 22 (22.9%) | 28 (15.8%) | 8 (17.0%) | 12 (14.0%) |
| No | 74 (77.1%) | 149 (84.2%) | 39 (83.0%) | 74 (86.0%) |
| Previous cancer history |  |  |  |  |
| Yes | 0 (0.0%) | 8 (4.5%) | 1 (2.1%) | 3 (3.5%) |
| No | 96 (100.0%) | 169 (95.5%) | 46 (97.9%) | 84 (96.5%) |
|  |  |  |  |  |
| Symptoms |  |  |  |  |
| Fever |  |  |  |  |
| Yes | 6 (6.3%) | 4 (2.3%) | 0 (0.0%) | 5 (5.8%) |
| No | 90 (93.7%) | 173 (97.7%) | 47 (100.0%) | 81 (94.2%) |
| Cough |  |  |  |  |
| Yes | 39 (40.6%) | 73 (41.2%) | 12 (25.5%) | 30 (34.9%) |
| No | 57 (59.4%) | 104 (58.8%) | 35 (74.5%) | 56 (65.1%) |
| Expectoration |  |  |  |  |
| Yes | 32 (33.3%) | 54 (30.5%) | 7 (14.9%) | 23 (26.7%) |
| No | 64 (66.7%) | 123 (69.5%) | 40 (85.1%) | 63 (73.3%) |
| Sputum with blood |  |  |  |  |
| Yes | 9 (9.4%) | 20 (11.3%) | 5 (10.6%) | 12 (14.0%) |
| No | 87 (90.6%) | 157 (88.7%) | 42 (89.4%) | 74 (86.0%) |
| Hemoptysis |  |  |  |  |
| Yes | 3 (3.1%) | 2 (1.1%) | 1 (2.1%) | 3 (3.5%) |
| No | 93 (96.9%) | 175 (98.9%) | 46 (97.9%) | 83 (96.5%) |
| Chest pain |  |  |  |  |
| Yes | 19 (19.8%) | 20 (11.3%) | 4 (8.5%) | 11 (12.8%) |
| No | 77 (80.2%) | 157 (88.7%) | 43 (91.5%) | 75 (87.2%) |
|  |  |  |  |  |
| Image data |  |  |  |  |
| Lung lobe |  |  |  |  |
| Left | 41 (42.7%) | 87 (49.2%) | 18 (38.3%) | 30 (34.9%) |
| Right | 55 (57.3%) | 90 (50.8%) | 29 (61.7%) | 56 (65.1%) |
| Position |  |  |  |  |
| Upper | 55 (57.3%) | 101 (57.1%) | 20 (42.5%) | 42 (48.9%) |
| Middle | 7 (7.3%) | 18 (10.1%) | 3 (6.4%) | 10 (11.6%) |
| Lower | 34 (35.4%) | 58 (32.8%) | 24 (51.1%) | 34 (39.5%) |
| Diametera (cm) | 1.8 ± 0.7 | 2.1 ± 0.6 | 1.8 ± 0.6 | 2.3 ± 0.6 |
| [SPNs area](https://xueshu.baidu.com/usercenter/paper/show?paperid=04066176ea30310666d3922d30e11816&site=xueshu_se) b(cm2) | 3.0 ± 2.1 | 3.7 ± 2.1 | 3.0 ± 2.0 | 4.4 ± 2.0 |
| Clear border |  |  |  |  |
| Yes | 36 (37.5%) | 67 (37.9%) | 18 (38.3%) | 37 (43.0%) |
| No | 60 (62.5%) | 110 (62.1%) | 29 (61.7%) | 49 (57.0%) |
| Calcification |  |  |  |  |
| Yes | 9 (9.4%) | 3 (1.7%) | 3 (6.4%) | 2 (2.3%) |
| No | 87 (90.6%) | 174 (98.3%) | 44 (93.6%) | 84 (97.7%) |
| Cavity |  |  |  |  |
| Yes | 4 (4.2%) | 15 (8.5%) | 2 (4.3%) | 4 (4.7%) |
| No | 92 (95.8%) | 162 (91.5%) | 45 (95.7%) | 82 (95.3%) |
| Spiculation |  |  |  |  |
| Yes | 47 (49.0%) | 106 (59.9%) | 26 (55.3%) | 53 (61.6%) |
| No | 49 (51.0%) | 71 (40.1%) | 21 (44.7%) | 33 (38.4%) |
| Mediastinal or hilar lymphadenopathy |  |  |  |  |
| Yes | 29 (30.2%) | 44 (24.9%) | 7 (14.9%) | 25 (29.1%) |
| No | 67 (69.8%) | 133 (75.1%) | 40 (85.1%) | 61 (70.9%) |
| Pleural thickening |  |  |  |  |
| Yes | 20 (20.8%) | 26 (14.7%) | 11 (23.4%) | 13 (15.1%) |
| No | 76 (79.2%) | 151 (85.3%) | 36 (76.6%) | 73 (84.9%) |
| Pleural adhesion |  |  |  |  |
| Yes | 13 (13.5%) | 40 (22.6%) | 12 (25.5%) | 18 (20.9%) |
| No | 83 (86.5%) | 137 (77.4%) | 35 (74.5%) | 68 (79.1%) |
| Pleural stretch |  |  |  |  |
| Yes | 23 (24.0%) | 58 (32.8%) | 15 (31.9%) | 28 (32.6%) |
| No | 3 (76.0%) | 119 (67.2%) | 32 (68.1%) | 58 (67.4%) |
| Pleural effusion |  |  |  |  |
| Yes | 1 (1.0%) | 4 (2.3%) | 0 (0.0%) | 2 (2.3%) |
| No | 95 (99.0%) | 173 (97.7%) | 47 (100.0%) | 84 (97.7%) |
|  |  |  |  |  |
| Laboratory data |  |  |  |  |
| VC (L) | 3.6 ± 0.7 | 3.2 ± 0.8 | 3.7 ± 0.9 | 3.2 ± 0.7 |
| FEV1 (L) | 2.8 ± 0.6 | 2.4 ± 0.7 | 3.0 ± 0.8 | 2.5 ± 0.6 |
| FEV1% | 97.1 ± 17.4 | 93.8 ± 17.9 | 97.6 ± 16.4 | 105.4 ± 78.8 |
| FEV1/FVC | 78.9 ± 8.9 | 76.6 ± 8.6 | 80.9 ± 10.0 | 77.6 ± 10.3 |
| RV/TLC | 36.2 ± 6.5 | 42.5 ± 31.1 | 39.8 ± 43.1 | 39.6 ± 5.9 |
| DLCO (mmol/min/kpa) | 5.8 ± 3.0 | 6.2 ± 2.9 | 6.0 ± 3.1 | 6.8 ± 7.4 |
| DLCO% | 96.4 ± 17.9 | 94.6 ± 22.9 | 98.3 ± 17.2 | 97.0 ± 16.6 |
| WBC (109/L) | 6.8 ± 1.9 | 6.8 ± 1.8 | 6.6 ± 1.1 | 7.0 ± 2.2 |
| Neutrophil (109/L) | 4.1 ± 1.6 | 4.2 ± 1.5 | 3.9 ± 1.0 | 4.3 ± 1.8 |
| Lymphocyte (109/L) | 2.0 ± 0.7 | 2.0 ± 0.6 | 2.0 ± 0.5 | 2.0 ± 0.7 |
| Monocyte (109/L) | 0.5 ± 0.2 | 0.5 ± 0.2 | 0.5 ± 0.2 | 0.5 ± 0.2 |
| PLT (109/L) | 220.5 ± 68.3 | 228.6 ± 68.4 | 227.8 ± 57.1 | 240.8 ± 68.8 |
| NLR | 2.2 ± 1.5 | 2.3 ± 1.0 | 2.2 ± 1.0 | 2.3 ± 1.4 |
| dNLR | 1.6 ± 0.8 | 1.7 ± 0.6 | 1.6 ± 0.8 | 1.7 ± 0.8 |
| LMR | 4.6 ± 2.0 | 4.7 ± 1.8 | 4.6 ± 1.8 | 4.8 ± 1.9 |
| PLR | 116.4 ± 40.4 | 126.3 ± 52.9 | 122.0 ± 45.1 | 127.5 ± 45.9 |
| SII | 493.6 ± 376.5 | 533.2 ± 328.6 | 487.5 ± 247.5 | 552.9 ± 372.8 |
| RBC (1012/L) | 4.8 ± 0.6 | 4.7 ± 0.6 | 4.8 ± 0.5 | 4.8 ± 0.6 |
| Hbg (g/L) | 140.3 ± 19.5 | 140.3 ± 16.3 | 143.1 ± 10.2 | 142.1 ± 12.3 |
| ALT (U/L) | 27.6 ± 19.3 | 23.3 ± 14.4 | 24.9 ± 16.1 | 22.5 ± 11.0 |
| AST (U/L) | 22.8 ± 8.6 | 21.7 ± 9.1 | 20.9 ± 6.3 | 20.5 ± 4.4 |
| LSR | 1.2 ± 0.4 | 1.0 ± 0.4 | 1.1 ± 0.4 | 1.1 ± 0.4 |
| TP (g/L) | 71.8 ± 5.3 | 72.2 ± 4.6 | 73.7 ± 5.6 | 71.6 ± 5.3 |
| ALB (g/L) | 43.6 ± 3.3 | 43.3 ± 2.7 | 44.6 ± 3.6 | 42.9 ± 2.9 |
| GLOB (g/L) | 28.2 ± 3.9 | 28.8 ± 3.7 | 29.2 ± 3.8 | 28.7 ± 3.9 |
| AGR | 1.6 ± 0.2 | 1.5 ± 0.2 | 1.6 ± 0.2 | 1.5 ± 0.2 |
| TBA (umol/L) | 5.8 ± 7.5 | 4.3 ± 3.6 | 4.0 ± 4.1 | 4.1 ± 3.2 |
| TBIL (umol/L) | 12.4 ± 4.8 | 12.0 ± 5.2 | 12.6 ± 5.3 | 11.3 ± 4.2 |
| DBIL (umol/L) | 3.7 ± 1.6 | 3.5 ± 1.6 | 3.9 ± 1.8 | 3.2 ± 1.0 |
| GGT (U/L) | 38.1 ± 36.1 | 32.1 ± 28.5 | 28.9 ± 19.2 | 34.6 ± 31.8 |
| ALP (U/L) | 76.2 ± 25.6 | 79.1 ± 25.4 | 76.8 ± 25.9 | 77.6 ± 25.6 |
| CRP (mg/L) | 5.4 ± 18.0 | 3.4 ± 8.5 | 3.0 ± 8.6 | 4.7 ± 24.3 |
| PNI | 53.7 ± 4.7 | 53.2 ± 4.1 | 54.6 ± 4.4 | 53.1 ± 4.5 |
| CRE (umol/L) | 75.9 ± 18.5 | 73.3 ± 16.5 | 74.8 ± 16.1 | 72.3 ± 16.8 |
| Cys-C (mg/L) | 0.9 ± 0.2 | 1.0 ± 0.2 | 0.9 ± 0.2 | 1.0 ± 0.2 |
| FBG (g/L) | 2.9 ± 1.0 | 3.0 ± 0.8 | 2.7 ± 0.8 | 3.0 ± 0.7 |
| Cyfra21-1 (ng/mL) | 2.9 ± 1.4 | 3.0 ± 1.5 | 2.5 ± 1.4 | 3.0 ± 1.3 |
| CEA (ng/mL) | 2.7 ± 2.0 | 5.0 ± 7.9 | 2.5 ± 1.7 | 7.9 ± 14.3 |
| NSE (ng/mL) | 12.4 ± 4.0 | 13.8 ± 4.1 | 12.5 ± 4.3 | 12.6 ± 3.1 |

a: The SPNs maximum diameter;